tion of all teachers of science in secondary schools, whether they are teaching in Ireland or elsewhere. We notice, too, that the department will, in August, 1908, award not more than six industrial scholarships—of the value of 80*l.* each, and renewable for a second and third year—to persons engaged in industries, such as the woollen, linen, leather, and tanning industries. The object of these scholarships is to enable selected persons, who must already have been engaged in one of the higher branches of the industry, to take a full course of instruction in an institution providing special courses of an approved character, with the view of training them for the management of such an industry. Candidates will be required to show that there is a reasonable expectation of their being able to find suitable employment in the industry in Ireland after the termination of their scholarships.

THE installation of Lord Morley of Blackburn as Chancellor of the University of Manchester took place on July 10. Replying to an address presented to him by the Vice-Chancellor, Mr. A. Hopkinson, Lord Morley dealt with the functions of universities. He urged those present not to allow technical teaching, valuable as that science was, to throw into a second place the true object and scope of a University. It is a remarkable and encouraging fact, he said, that there has been no disposition during the last twenty or twenty-five years among the many benefactors of these institutions to limit their benefactions. On the contrary, some of the most remarkable of these benefactions have been for music, for philosophy, for theology, and for literature. This would seem to justify the hope that merely and purely technical teaching will not drive out teaching of the University type. After the installation Lord Morley and Mr. Arthur Balfour were entertained at luncheon. Mr. Balfour, in replying to a toast, said:—"In order to pursue knowledge to the best advantage, knowledge must be pursued for her own sake; and she is more likely to be successfully pursued for her own sake in a great academical house than by any other method or machinery which the wit of man has as yet devised. As knowledge is to be pursued for its own sake, mankind has found its greatest instrument for the better prosecution of knowledge in science. The great advancement of mankind is to be looked for in our ever-increasing knowledge of the secrets of nature—secrets, however, which are not to be unlocked by the men who pursue them for purely material ends, but secrets which are open in their fulness only to men who pursue them in a disinterested spirit. The motive power which is really going to change the external surface of civilisation, which is going to add to the well-being of mankind, which is going to stimulate the imagination of all those who are interested in the universe in which our lot is cast, that lies after all with science. I would rather be known," Mr. Balfour continued, "as having added to the sum of our knowledge of the truth of nature than anything else I can imagine. Unfortunately for me, my opportunities have lain in different directions; but the happiest of men surely are those whom fortune has given time, leisure, the opportunity, and, above all, the genius which enables them to penetrate into the secrets of nature in such a way that, perhaps unknown to themselves, unknown even to the generation in which they are born, something will have been given to mankind which posterity can develop into some great practical discovery on which the felicity of mankind may depend."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 12.—"On Reciprocal Innervation in Vaso-motor Reflexes and the Action of Strychnine and of Chloroform thereon." By Dr. W. M. **Bayliss,** F.R.S.

(1) In depressor reflexes there is, along with inhibition of tone in the vaso-constrictor centres, an excitation of vaso-dilator centres. This has been shown in the cases of the submaxillary gland, the penis, the hind-limb, the external ear, and probably the tongue.

(2) Correspondingly, in pressor reflexes, along with excitation of constrictors, there is, in appropriate conditions, inhibition of dilator tone. This is, however, more difficult to demonstrate.

(3) Similarly, in the local, or Lovén, reflexes, there is also both excitation of dilators and inhibition of constrictors.

(4) The action of strychnine is to convert the inhibitory phase of all vascular reflexes into an excitation, so that:—

(5) The depressor nerve produces a rise of blood-pressure under full doses of the alkaloid. It does this by exciting the constrictor centre by the same mechanism which normally inhibits it.

(6) In the "dilator" animal under strychnine, pressor reflexes become depressor, in that inhibition of dilators is converted into excitation.

(7) Various parts (synapses) of the reflex arc are differently sensitive to the alkaloid, the synapse of the pressor fibres with the constrictor centre being the first to show paralysis as the dose is increased.

(8) In the "dilator" animal strychnine causes a fall of blood-pressure on injection by exciting dilator centres. In the normal animal the first dose causes a rise, and subsequent ones a fall of pressure, since the first dose, if not too small, after exciting the vaso-constrictor centre, paralyses the synapses concerned, so that the simultaneous excitation of the dilator centres can now make itself felt.

(9) The excitation of constrictors produced by reversal of inhibition is more resistant to the alkaloid than that produced in the normal way.

(10) Asphyxial blood does not act directly on the efferent constrictor neurones, since it has no action at a stage of strychnine poisoning at which the depressor still excites constriction, by reversal of inhibition.

(11) Chloroform converts pressor into depressor reflexes (in the rabbit) by reversal of excitation of constrictors into inhibition.

(12) This effect of chloroform is not exerted on the efferent neurones directly, but at some point considerably earlier in the reflex arc. This is shown by the fact that asphyxial blood causes rise of pressure when excitation of sensory nerves causes fall.

June 4.—"The Optical Constants of Gypsum at Different Temperatures, and the Mitscherlich Experiment." By Dr. A. E. H. **Tutton,** F.R.S.

The experimental work on selenite now described confirms the author's previously published conclusion, derived from other examples, that the phenomenon of crossed-axial-plane dispersion is due to very low double refraction, combined with close approximation of the intermediate index of refraction to one of the extreme indices, and to the fact that change of wave-length of the light or change of temperature, or both, cause the intermediate index to approach still nearer to the extreme one in question until it becomes identical with it, and eventually to pass it, the relative positions of the two indices thus becoming reversed. The uniaxial rectangular cross and circular rings are produced at the critical point of identity. This critical point is a function of both wave-length and temperature, being a fixed one only for a particular wave-length and specific temperature. The temperature has a maximum for wave-length 573 on the greenish-yellow side of the D lines (589). The optic axial angle has a maximum for the same wave-length 573, for all temperatures below that of the crossing of the optic axes, and a minimum for temperatures superior thereto up to the temperature of decomposition (120°) of selenite. The change of orientation of the median lines (bisectrices of the optic axial acute and obtuse angles) within the symmetry plane, at any specific temperature, also exhibits a critical limit for this greenish-yellow light of wave-length 573, which is thus a very important radiation in connection with the optics of selenite. The range of temperature which includes the production of the uniaxial figure for all colours of the spectrum does not exceed 4°, varying in different crystals from 3°·5 to 4°. The absolute temperatures of crossing for the four crystals investigated varied 9°, the maxima (for wave-length 573) varying from 105°·5 to 114°·5, corrected for conduction of crystal holder.

Zoological Society, June 16.—Dr. Henry Woodward, F.R.S., vice-president, in the chair.—Photographs and fragments of skin and bone of a mammoth and a rhinoceros discovered in an ozokerite mine at Starunia, Galicia:

Dr. A. Smith **Woodward.** The carcases of these animals appeared to have found their way into an old marsh saturated with petroleum, which had completely preserved them. The photographs and specimens had been received from Dr. George von Kaufmann, who intended to present them to the British Museum.—The lower jaw of a young Canadian beaver in which there was present on each side a small conical tooth anterior to the deciduous premolar: Dr. C. I. Forsyth **Major.** The supernumerary premolar was considered to be a case of atavism.—Drawings made from examples of two species of Castor from the East Runton forest-bed: Dr. Forsyth **Major.** It was remarked that truly forest-bed species were found in association with Pliocene species.—Photographs of Pliocene Bovinæ from specimens in the Florence Museum: Dr. Forsyth **Major.** These unpublished figures showed the great variability of the Pliocene Bovinæ. The exhibitor endorsed Falconer's opinion that these Pliocene Bovinæ were nearly related to the primitive buffaloes from the Siwaliks.—Mammals from the provinces of Chih-li and Shan-si, N. China, collected by Mr. M. P. Anderson, being the tenth of the series of papers on the results of the Duke of Bedford's zoological exploration of eastern Asia: Oldfield **Thomas.** Very little material had hitherto existed from this part of northern China, although a certain number of specimens had been sent to Paris by Pere David, and it was therefore of great importance to have a series representing the species he discovered for comparison with mammals from other regions. The present collection consisted of about 100 specimens, belonging to twenty species, of which several are new.—A case of imperfect development in *Echinus esculentus*: J. **Ritchie** and D. C. **McIntosh.**—The minute structure of calcareous sponge-spicules: Prof. E. A. **Minchin** and Dr. D. J. **Reid.** The primary object of this investigation was to demonstrate, by means of photomicrographs, certain structures, the existence of which had been strenuously denied by some of the most competent of previous investigators, namely, the presence, after the spicules had been cautiously decalcified, of a residue in the form of an axial filament which could be stained and rendered evident by certain dyes, in addition to the sheath universally acknowledged to exist. The axial filament was found to be very distinct in the spicules of Clathrinidæ, but much less so in those of Leucosoleniidæ and Heterocœla. Incidentally, the study of the axial filaments led to some interesting conclusions regarding the comparative morphology of the two principal types of spicules, monaxon and triradiate, occurring in calcareous sponges.—*Cyaniris chennellii* of de Niceville: Dr. T. A. **Chapman.** It was shown that this was not a Cyaniris (Celastrina, Tutt), but belonged to a new genus near to Everes, and that a specimen in Colonel Bingham's collection, placed with *chennellii*, was a species almost entitled to be placed in Cyaniris, for which he proposed new generic and specific names. Another specimen of the latter species was in the Tring Museum. It was suggested that de Niceville had both these species together in dealing with *chennellii*, and unfortunately selected as his type the one that was not a Cyaniris. The two forms probably fly together, and are therefore mimetic.—(1) A contribution to knowledge of the batrachian *Rhinoderma darwini*; (2) some notes upon the anatomy of *Chiromys madagascariensis*, with references to other lemurs: F. E. **Beddard.**—*Leucocytozoon musculi*, sp.n., a parasitic protozoon from the blood of white mice: Annie **Porter.** The parasites occur in mononuclear and transitional leucocytes, and free in the plasma. The free trophozoites are gregariniform vermicules, their average size being 10·9 μ long by 5·1 μ broad.—Descriptions of African micro-Lepidoptera: E. **Meyrick.** 108 species and eleven genera of Tortricina and Tineina from the African region (especially the Transvaal) were described as new.—A collection of calcareous sponges made by Mr. Cyril Crossland in the Cape Verde Islands: A. G. **Thacker.**

Royal Microscopical Society, June 17.—Mr. A. N. Disney in the chair.—*Exhibits.*—A lens for high-power microscopy to obviate the use of the oscillating screen: J. W. **Gordon** and H. Fletcher **Moulton.**—A small, simple microscope by Cary: A. **Skinner.** The instrument was only 4¾ inches high. It was provided with a plane mirror and a mechanical stage having movements of 4/10-inch horizontally and ½-inch vertically. Focussing the object was effected by moving the stage by rack and pinion, the teeth of the rack being set obliquely, as in modern microscopes.—Micro-slides illustrating the structural parts of the chick at various stages of its development from about two days to 4½ days: A. **Flatters.**—Stereophotomicrographs: Wm. P. **Dollman.** These were photographs of Alveolina ×6, fungus in eye of horse×350, statoblast of a freshwater polyzoa from Bombay×350, *Biddulphia antediluviana* from Baltic mud×350.—*Papers.*—Cycloloculina, a new generic type of Foraminifera found on the shore of Selsey Bill: E. **Heron-Allen** and A. **Earland.** The paper was illustrated by a large map, on which the localities where the specimens were collected were pointed out. A number of slides of specimens under microscopes, and lantern-slides were shown upon the screen. Mr. Earland remarked that he believed they would eventually trace the specimens to some Eocene deposit which was not exposed above low-water mark. The source of origin could not be very far away from the place of discovery, for the specimens were too fragile to travel any considerable distance.—Illuminating apparatus for the microscope: J. W. **Gordon.** The light from a Nernst lamp is transmitted through a glass rod, the end of which nearest to the lamp is cut to a plane surface and finely ground; the other end has a polished surface, flat or lenticular in form, according to the user's requirements.—*Corethron criophilum*: E. M. **Nelson.**

Linnean Society, June 18.—Dr. D. H. Scott, F.R.S., president, in the chair; afterwards, Dr. A. Smith Woodward, F.R.S., vice-president.—Altitude and distribution of plants in southern Mexico: Dr. Hans **Gadow.**—Reports on the marine biology of the Sudanese Red Sea from collections made by Mr. Cyril Crossland, together with collections made in the Red Sea by Dr. R. Hartmeyer. On the Bryozoa, part i., Cheilostomata: A. W. **Waters.** The author enumerates thirty-nine species of Cheilostomata collected by Mr. Crossland, and twenty-three collected by Dr. Hartmeyer; besides these, eighteen other species are known from the Red Sea, making eighty Cheilostomata in all. The distribution of Red Sea species is in most cases very wide, often extending from the Atlantic to Eastern seas.—The algæ of the Yan Yean reservoir: G. S. **West.**—*Gardenia Thunbergia* and its allies: Dr. **Stapf** and J. **Hutchinson.** These Gardenias, fifteen in number, form the bulk of the section Eu-Gardenia in Africa, and extend over the whole of the continent with the exception of the temperate north. Owing to the instability of certain characters and the scantiness of the material in the older collections, they have not been well discriminated so far, with the result that *Gardenia Thunbergia* came to cover finally half a dozen perfectly distinct species ranging all over Africa, whilst the plant originally described under that name is actually confined to a limited area in South Africa. The distinctive characters of the species admitted—of which six are here described for the first time—are set out in key form, whilst their distribution and synonymy and full descriptions of the new species are given in the second part of the paper. It is also pointed out that the segregation of the "Thunbergia" group from the closely allied Indo-Malayan stock of § Eu-Gardenia must have taken place in pre-Tertiary times.—The marine algæ collected in the Indian Ocean by H.M.S. *Sealark*: A **Gepp.**—Nudibranchs from the Red Sea, collected by Mr. C. Crossland: Sir Charles **Eliot.**

Royal Anthropological Institute, June 23.—Prof. W. Ridgeway, president, in the chair.—The Kurdish tribes of the Ottoman Empire: Mark **Sykes.** The tribes, of which the author distinguished about 323, inhabit that part of Asiatic Turkey between Uruma, in Persia, and Angora, in Asia Minor. Classification is difficult. They may be distinguished as nomadic, semi-sedentary, and sedentary, but any other kind of classification is almost impossible. As to religion, there are to be found among them Sunni Moslems, Shias, Devil worshippers, Pagans, Pantheists, and Christians. Linguistically, they are divided into a variety of dialects, which are said to form two broad divisions, Zaza and Kermanji. Physically, the most extraordinary contrasts are to be found. In Hakkiari they are small, wiry mountaineers; tall, slim horsemen in Irak; those north of Lake Van are clumsy, heavily built, big-boned, and hook-nosed; in north Mesopotamia they are full-bearded, with regular features; while to the north and west of Erzinjian the men are fair-haired and of ruddy complexion. In point of civilisation the contrasts are just as marked.

CAMBRIDGE.

Philosophical Society, May 18.—Mr S. Ruhemann, vice-president, in the chair.—Radio-activity of solutions of potassium salts: N. R. **Campbell.** (1) All attempts to observe or to produce any difference in the activity of different samples of the same potassium compound in the same physical state have failed completely. No evidence has been obtained of any such separation of the activity as is to be expected, whatever view may be taken of the source of the activity. (2) The activity of a thick layer of a potassium compound is not accurately proportional to the amount of potassium which it contains. It is probable that the variation from strict proportionality is to be attributed to a difference in different compounds of the values of the ratio of the density of the substance to the absorption coefficient of the rays emitted by it. In the case of solutions, at least, the variations in the value of this ratio are surprisingly large and irregular. The ratio is not necessarily greater for the solution of greater density or greater concentration.—A preliminary note on an effect observed when palladium foil is heated in air at a low pressure: Rev. H. V. **Gill.** Strips of palladium foil were mounted in a glass tube so that they could be heated by means of an electric current. When heated in air at a pressure of about 0·15 mm. first to a dull red and then to a bright white heat, the palladium foil was seen to be surrounded by a purple-blue glow. This glow had all the appearance of a kathode discharge in a vacuum tube. There was no electric field except that due to the current which came from two storage cells to heat the foil. The glow gradually disappeared, and could not be again obtained from a strip which had been already used. This experiment was repeated many times, and with palladium foil obtained from different sources. The cause of this glow is being investigated.—The absorption spectra of some compounds of pyridine (second paper): J. E. **Purvis.** The results indicate that in these isomeric compounds the relative positions and the persistencies of the absorption bands are influenced by the type and the spatial positions of the atoms or groups of atoms introduced into the nucleus.—Further researches in the theory of divergent series and integrals: G. H. **Hardy.**—Some reactions of phenyliodidechloride and iodosobenzene acetate: H. H. **Hodgson.**—Integral forms and their connection with physical equations: R. **Hargreaves.**—The determination of the rate of chemical change by measurement of the gases evolved: F. E. E. **Lamplough.**

MANCHESTER.

Literary and Philosophical Society, May 12.—Prof. H. B. Dixon, F.R.S., president, in the chair.—Spore formation in the genus Chætoceros: Miss Nellie **Snape.** Spined resting spores occur during the late summer; these are set free by the breaking up of the Chætoceros filament and the throwing off of the old shells. Individuals of Chætoceros are also often seen containing a number of small rounded spore-like bodies formed by the contraction of the protoplasm and its aggregation round the chromatophores. The number of these bodies varies considerably, but their size is remarkably constant. It would appear rather probable that these spore-like bodies are really gametes, but confirmatory evidence on this point is at present lacking.—The mummy of Khnumu Nekht in the Manchester Museum: Miss Margaret A. **Murray.** The coffin was found in a rock tomb at Rifeh, near Assiout, in Upper Egypt, and dates from the XIIth Dynasty, or, roughly, about 2500 B.C. That this was a real mummy was shown by the fact that the nails of the hands and feet were carefully bound with threads so as to preserve them in position when the epithelium fell away. This proves the practice of mummifying, which rapidly disappeared on the introduction into Egypt of Christianity, to be more ancient than some have maintained, who give 1600 B.C. as the earliest date of its occurrence. The practice was held by some to be connected with the belief in re-incarnation. On the coffin were inscriptions said to be variants of the Pyramid text. Some of these read as follows:—"Thy mother Nut spreads herself above thee: she causes thee to be as a god without enemies"; "Comes to thee, comes to thee, thy mother Nut"; "To Anubis, Lord of Sepa, may he grant that thou cross heaven, and that thou reach land at the pure places which are in heaven."—Dr. **Cameron** gave an account of the anatomical features of the remains. The bones were remarkably slender. Measurements of the capacity and "indices" of the skull showed that it compared favourably with the average modern European type, whilst the limb bones rather tended towards the Simian character. There were indications that Khnumu Nekht was of lethargic habit, and spent much time in a squatting posture. His height was probably between 5 feet 3 inches and 5 feet 10 inches, and his age between sixty and seventy years. The teeth, with the exception of one, were intact, and only one of them showed any sign of decay, but all were extraordinarily worn, which showed that the food consumed must have been exceedingly gritty.

EDINBURGH.

Royal Society, June 22.—Prof. Ewart, F.R.S., vice-president, in the chair.—Equilibrium in the system water, and a pair of enantiomorph solids: Dr. W. W. **Taylor** and Dr. T. **Rettie.** The system investigated was water and the optically active tartar emetics, the systems water with *r* tartar emetic along with *d*- or *l*-tartar emetics being also included to complete the scheme. Series of confirmatory experiments were made with *d*- and *l*-sodium ammonium tartrates and sodium ammonium racemate. In the former case the transition temperature was unknown; it was determined by the solubility and dilatometer methods to be between 60° and 61° C. It was confirmed by crystallisation experiments above and below the transition temperature. The results show that the enantiomorph solids behave as two absolutely distinct phases, any mixture of the two being more soluble than either component alone; and the maximum solubility is possessed by the equimolecular mixture. Owing to the occurrence of labile equilibria, true equilibrium in each system was found to be attained much more slowly than was generally supposed. In some cases 20 days' shaking was found to be necessary.—The electrolytic conductivity of aqueous solutions of lactic acid, and on changes in conductivity accompanying the alcoholic fermentation: Dr. John **Gibson** and Andrew **King.**—An improved thermostat and other apparatus used in conductivity work: Dr. John **Gibson** and G. E. **Gibson.**—Determinations of the conductivity of concentrated solutions of good electrolytes:—(1) hydriodic and hydrobromic acids: Dr. John **Gibson** and Andrew **King**; (2) hydrochloric acid: Dr. John **Gibson** and W. H. **Paterson**; (3) ammonium bromide, lithium bromide, and sodium bromide: Dr. John **Gibson** and Dr. E. B. R. **Prideaux.**—The precipitation of certain chlorides by hydrochloric acid: Dr. John **Gibson** and Dr. R. B. **Denison.** These papers all bore more or less upon a general line of research which has occupied Dr. Gibson's attention for years. The discussion of the facts established was held over for a future communication. The improved thermostat was electrically controlled, the circuit of the incandescent lamps which supplied the heat being interrupted or closed (as the case might be) by an electromagnetic relay controlled by a modification of the usual form of cut-off. By means of this thermostat the temperature could be kept absolutely constant for months at a time.—Andrews's measurements of the compression of carbon dioxide and of mixtures of carbon dioxide and nitrogen: Dr. C. G. **Knott.** This completed a work which was begun by Prof. Tait in 1899 with the view of supplying the true pressures as indicated by the air and hydrogen manometers used by Andrews in his well-known experiments. See a letter by K. Tsuruta, of Tokyo, in Nature, February 2, 1899, which directed attention to the importance of finding the true pressures instead of those given by Andrews and explicitly referred to by him as only provisional. With the assistance of Dr. Andrews's daughter, Miss M. K. Andrews, the experimental notebooks had been carefully and successfully investigated, and the data obtained from which the true pressures could be calculated.

Paris.

Academy of Sciences, July 6.—M. Bouchard in the chair.—A fundamental hypothesis implicitly admitted in the classical treatment of astronomy: J. **Boussinesq.** It has been implicitly assumed that the path of any planet with respect to the sun forms a closed trajectory described periodically. The tendency to make the simplest hypothesis consistent with the observed facts is unavoidable; thus the ancient astronomers assumed circular uniform motion for the stars, an assumption which had to be complicated as observations became more exact.—The triboluminescence of racemic compounds: D. **Gernez.** It has been shown by Tschugaeff that whilst with certain optically active bodies both the right- and left-handed constituents are triboluminescent, the racemic compound is not so. The author has filled up some gaps in Tschugaeff's table, and added fresh optically active substances, but is unable to confirm his hypothesis. There seems to be no general relation of cause and effect between triboluminescence of bodies and their symmetrical or unsymmetrical constitution.—The eclipse of the sun of June 28, 1908, at the Observatory of Lyons: Ch. **André.** The results of observations of contacts, chords, and angles of position. The last contact was partially obscured by clouds.—The action of metallic oxides on primary alcohols. The case of oxides undergoing reduction: Paul **Sabatier** and A. **Mailhe.** The simplest case is that of the oxides of antimony and bismuth, which, at 360° C., are reduced to metal, water and aldehyde being the only products. With HgO and MnO_2 the oxidation goes further, some carbon dioxide being formed. The reduced metal in these cases shows no catalytic power, but with nickel, cobalt, lead, and copper the catalytic effects of the reduced metal are added to the reducing power of the oxides, and the reaction becomes more complicated. With some metals (iron, cadmium, tin) the oxides also can act catalytically.—The floating population on canals and public health: MM. **Chantemesse** and **Pomès.** The possibility of infection being carried in this way was overlooked in the legislation of 1902. Cases are cited showing how widely infection has been carried by canal boats, and the necessity of suitable prophylactic measures is pointed out.—Some new peculiarities of short-period variable stars: a method of distinguishing their effects from those due to dispersion in a vacuum: Charles **Nordmann.** It is shown that the results obtained by the method of monochromatic images can separate, for a numerous class of variable stars, the two classes of phenomena in question.—The variations of duration of twilight: Ernest **Esclangon.** The visibility of celestial objects, depending as it does on two factors, the apparent brightness of the sky and the transparency of the air, is a faulty method of observation; the photometric state of the sky is more suitable for quantitative study. The great influence of suspended particles in the air is pointed out, and the abnormal twilight of July 1 considered from this point of view.—The partial eclipse of the sun observed at the Observatory of Besançon on June 28, 1908: MM. **Brück, Chofardet,** and **Pernet.**—Observation at the Observatory of Marseilles of the partial eclipse of the sun of June 28, 1908: Henry **Bourget.**—A problem relating to the theory of partial differential equations of the hyperbolic type: A. **Myller.**—A new integrometer: M. **Jacob.** The apparatus described on May 11, 1908, allows the integration of the equation

$$y' = Ay^3 + By^2 + Cy + D,$$

if a particular solution of this equation is known. By slightly modifying the apparatus, the latter restriction is removed.—The useful weight of aëroplanes: Rodolphe **Soreau.**—The use of detectors, sensitive to electric oscillations, based on thermoelectric phenomena: C. **Tissot.**—Researches on ionised gases: A. **Blanc.** The method of measurement used was a modification of the alternating field method of Rutherford, and was applied to the study of mixtures of carbon dioxide and hydrogen, and air and carbon dioxide. The mobility in air of an ion produced in carbon dioxide is the same as if this ion had been directly produced in air, and this is true for ions of both signs.—The influence of temperature on the electromotive force of the cadmium element: R. **Jouaust.** The formula given in 1901 by Jäger and Lindeck for the variation in the electromotive force of the cadmium cell between 0 and 20 for an amalgam containing between 12 and 13 per cent. of cadmium has been confirmed. More recently, Smith has stated that between 10° and 20° C. amalgams of 10 per cent. and 12·5 per cent. show an identical relation; this, however, is now shown not to be true at 0° C., and the anomalies shown by the cells with 10 per cent. amalgam require further investigation.—Interference fringes shown by colour photographs: E. **Rothé.**—A repeating auto-ballistic galvanometer: A. **Guillet.** If successive small impulses are imparted to the ballistic needle at periods corresponding to its vibration period, a large increase of sensibility results. An automatic arrangement for effecting this is described in the present paper.—Dynamos without a collector: C. **Limb.** The application of electrolytic values to dynamos.—The stability of the alternating arc as a function of the atomic weight of the metals forming the electrodes: C. E. **Guye** and A. **Bron.**—The orientation of crystals by the magnetic field. The importance of the optical properties of mixed liquids from the point of view of crystalline symmetry: A. **Cotton** and H. **Mouton.**—The phenomena of Bose and the laws of contact electrification: Édouard **Guillaume.**—The Bose-Guillaume phenomenon and contact electrification: Jean **Perrin.**—A relation between the magnetic and chemical properties of complex iron salts: P. **Pascal.**—The total heats of baryta, witherite, and fused lime: M. **Latschenko.**—The development of negatives in radiography: Maxime **Ménard.** A description of the modification in the details visible in the negative which can be produced by variations in the method of working with the same developing bath.—The influence of the medium on the Brownian movements: Victor **Henri.** A quantitative study by means of a kinematograph microscope of the effects produced by the addition of various amounts of acids and alkalis to the latex of india-rubber. A new iodide of titanium, titanous oxide, TiI_2: Ed. **Defacqz** and H. **Copaux.** The new iodide is obtained by the action of mercury vapour upon TiI_4 in an atmosphere of hydrogen at a red heat.—The heat of neutralisation of picric acid by various aromatic bases in benzene solution: Léo **Vignon** and M. **Évieux.** Picric acid differs from acetic and benzoic acids in that it forms salts readily with aromatic bases in benzene solution. It furnishes examples of formation of salts in the absence of ionisation.—The direct transformation of borneol into campholic and isocampholic acids: Marcel **Guerbet.** If borneol is heated in sealed tubes at 250° to 280° with recently fused potash it is almost quantitatively converted into the potassium salts of campholic and *iso*campholic acids, hydrogen being evolved.—The preparation of benzoylacetic esters: A. **Wahl.** By the action of sodium upon an ethereal solution of ethyl benzoate, benzoin is produced. Hence, in the condensation of ethyl acetate and benzoate with sodium, three distinct reactions are produced.—Ergosterin and fongosterin: C. **Tanret.**—Study of the *rôle* of yeasts in the aldehydification of alcohol: MM. **Trillat** and **Sauton.**—The influence of formic acid vapours on the growth of *Rhizopus nigricans*: Henri **Coupin.**—The recollection of the tides in *Convoluta Roscoffensis* and its alteration: Louis **Martin.**—The structure of the renal cell: L. **Bruntz.**—The first venous circulation of *Carassius auratus*: P. **Wintrebert.**—Study of the immunising action of chlorinated derivatives of bacilli: MM. **Moussu** and **Goupil.**—The quaternary alluvium of the Loire and Allier: E. **Chaput.**

NEW SOUTH WALES.

Linnean Society, May 27.—Mr. J. H. Maiden, vice-president, in the chair.—The behaviour of *Hyla aurea* to strychnine: Dr. H. G. **Chapman.** The common Australian frog *Hyla aurea* has been noted not infrequently to be much less susceptible to the poisonous alkaloid strychnine than European frogs of the genus Rana. The minimal lethal dose for various species of Rana has been measured by numerous observers, and there seems to be general agreement that it may be said to lie between 2 mg. and 5·5 mg. per kilogram of body-weight. For *Hyla aurea* the minimal lethal dose is 0·1 mg. per gram of body-weight, and is somewhat higher in frogs collected in winter than in those collected in summer, but is unaffected by differences in sex. The receptive substance of the muscles of *Hyla aurea* is sensitive to strychnine, so that the frogs show, with appropriate doses, typical curare paralysis. The prominence of this action produces a characteristic type of poisoning in Hyla.—Notes from the Botanic Gardens, Sydney, No. 13: J. H. **Maiden** and E. **Betche.** The authors described several new species, new varieties, new records for New South Wales, and new localities, and made some remarks on notable plants.—A contribution to our knowledge of Australian Hirudinea. Part i.: E. J. **Goddard.**

CALCUTTA.

Asiatic Society of Bengal, June 3.—Tibetan charms obtained by Lieut.-Colonel S. H. Godfrey in Ladakh, one for chasing away evil spirits and the other for compelling fortune: Dr. S. C. **Vidyabhusana.** These two charms are printed from wood blocks, and used by people of Ladakh who are entirely ignorant of the meaning of the writing on them. The writing is Sanskrit in Tibetan characters.—A polyglot list of birds in Manchu, Chinese, and Turki: Dr. E. D. **Ross.**—Materials for a flora of the Malay Peninsula, part No. 21: Sir George **King** and J. S. **Gamble.** The part contains the two families which complete the Gamopetalæ, viz. No. 86, Gesneraceæ, and No. 90, Verbenaceæ. A review of the former of these families was published in 1905 by Mr. H. N. Ridley, director of the Singapore Botanic Garden, in the Journal of the Straits Branch of the Royal Asiatic Society, but as the form of that publication was not quite the same as has been used by Sir G. King and his various helpers, Mr. Ridley's work has been revised by Mr. Gamble with the help of Lieut.-Colonel D. Prain, of Kew. The Verbenaceæ have been worked up by Mr. Gamble. Part No. 21 also contains the addenda and corrigenda of the Gamopetalæ and the index to vol. lxxiv.—Note on the peregrine falcon (*Falco peregrinus*): Lieut.-Colonel D. C. **Phillott.**—The use of the abacus in ancient India: E. R. **Kaye.** Tylor, Woepcke, Rodel, Burnell, Bayley, and other writers on Indian mathematics assume that the abacus was in common use in ancient India, but they give no evidence of such use. They, however, on this assumption build up elaborate arguments to prove that our arithmetical notation was invented in India, and incidentally that the Arabs owe their arithmetic to the Hindus. An examination of their statements shows that their assumption is unwarranted, and, indeed, that no evidence at all has yet been given of the use of this instrument in ancient India. This, of course, does not prove that the abacus was not used by the early Hindus, and it is with the idea of eliciting evidence on this point, if it exists, that this paper was read.—Plea for an aquarium in Bengal: Rai Ram Brahma **Sanyal.** The author advocates the establishment of an aquarium at Puri, chiefly for the study of economic questions regarding the fisheries of the Bay of Bengal.—A descriptive list of works on the Madhyamika philosophy: Dr. S. C. **Vidyabhusana.** This paper gives a short account of the Tibetan versions of twenty-seven works on the Madhyamika philosophy, the Sanskrit originals of which, with one exception, appear to have long been lost. The Tibetan versions are included in the well-known collection called the Tangyur, which the writer of the paper examined while residing at the monastery of Labrang, in Sikkim, in June, 1907. They include the works of Arya Nagarjuna, Arya Deva, and Buddha Palita, besides those of the teacher Bhavya, who criticised the contemporaneous systems of Hindu philosophy, viz. the Yoga, Samkhya, Vaiśesika, Vedanta, and Mimamsa. These works, which have not been noticed elsewhere, are very important, as they throw a good deal of light on the history of Indian philosophy.—The mechanical, physical, and chemical theories of the ancient Hindus, part i.: Principal B. N. **Seal.** A synoptic view of the mechanical, physical, and chemical theories of the ancient Hindus, based chiefly on the Vyasa Bhashya or Patanjali's Sutras, the Samhita of Charaka, the Bhashya of Prasastapada, the Vartika of Udyotakara, and the Vrihat Samhita of Varaha Mihira, which belonged to the fourth, fifth, and sixth centuries of the Christian era.—Geometrical theory of a plane non-cyclic arc; finite, as well as infinitesimal: Prof. S. **Mukhopadhyaya.**—A memoir on the surgical instruments of the Hindus, with a comparative study of the instruments of Greek, Roman, Arab, and modern European surgeons, part i.: Dr. G. N. **Mukhopadhyaya.** The author describes the surgical instruments of the Hindus, and concludes that knowledge of the kind was considerably more advanced among them than previously held to be.—Rationalisation of algebraical equations: Mahendranath **De.**

CONTENTS.

PAGE

Experimental Entomology. By **F. A. D.** 241
Infinite Series. By **G. B. M.** 242
Studies in Education 242
Elementary Electricity 243
Our Book Shelf:—
  Knuth: "Handbook of Flower Pollination, based upon Herman Müller's Work 'The Fertilisation of Flowers by Insects'" 244
  Tibbles: "The Theory of Ions: a Consideration of its Place in Biology and Therapeutics" 244
  Rye: "The Libraries of London: A Guide for Students" 244
Letters to the Editor:—
  The Spectrum of Radium Emanation.—**Sir William Ramsay, K.C.B., F.R.S., and A. T. Cameron** 245
  The Kinetic Energy of the Ions emitted by Hot Bodies.—**Prof. O. W. Richardson** 245
  Absorption of X-Rays.—**Dr. C. G. Barkla and C. A. Sadler** 245
  The Form of Birds' Egg.—**A. R. Horwood** . . . 246
  Lord Kelvin's Philosophy.—**Dr. W. Peddie** 246
  The Magnetic Separation of Heavy Minerals in the Field.—**J. D. Falconer** 247
  The Sky Glows.—**W. F. Denning** 247
  A Remarkable Solar Halo.—**Charles J. P. Cave** . 247
  Proposed Admission of Women to the Fellowship of the Chemical Society.—**Sir W. Ramsay, K.C.B., F.R.S.** 247
  Linnæus's Authorities.—**Prof. Karl Pearson, F.R.S.** 247
The Mines of the British Empire. (*Illustrated.*) . . 248
The Secondary Oscillations of Oceanic Tides. (*Illustrated.*) 249
Vestiges of Scales in the Fox 250
Notes 251
Our Astronomical Column:—
  Saturn's Rings 255
  New Photographic Celestial Charts 255
  Double Stars 255
  The Albedoes of Jupiter's First and Third Satellites . 255
  A Bright Meteor 255
  Latitude Variation 255
Archæological Exploration in Guatemala. (*Illustrated.*) 256
The New Buildings of the University of Leeds. By **J. B. C.** 257
A Cape Catalogue of Stars. By **A. M. W. D.** . . . 258
University and Educational Intelligence 259
Societies and Academies 260